

# Exhibit I

## (previously filed as Dkt. 660-9)

Page 1

1 IN THE UNITED STATES DISTRICT COURT  
2 FOR THE EASTERN DISTRICT OF VIRGINIA  
3 Alexandria Division

4 | - - - - - - - - - - - - - - - - +

5 UNITED STATES OF AMERICA,  
et al.

	Plaintiffs,	Case Number:
7		
	vs.	1:23-cv-00108-
8		LMB-JFA
9	GOOGLE, LLC,	
0	Defendant.	

11 | - - - - - - - - - - - - - - - - - +

20 Veritext Job 6456904  
21 Reported by: Laurie Donovan, RPR, CRR, CLR

<p style="text-align: right;">Page 26</p> <p>1 institutional details, learning as much as I 2 can before applying these economic 3 frameworks.</p> <p>4 BY MR. ISAACSON:</p> <p>5 Q Before the fall of 2019, did you 6 consider yourself an expert in digital 7 advertising?</p> <p>8 MR. NAKAMURA: Objection to form.</p> <p>9 THE WITNESS: Again, I'm here testifying 10 as an economic expert with training in 11 industrial organization.</p> <p>12 BY MR. ISAACSON:</p> <p>13 Q So before the fall of 2019, before 14 you're hired to testify in this case, did you 15 consider yourself an expert in digital 16 advertising?</p> <p>17 MR. NAKAMURA: Objection to form.</p> <p>18 THE WITNESS: Probably depends on what 19 you referred to as "expert," but I knew a 20 little bit of it, about digital advertising, 21 based on my prior experience, but I have not 22 published any work on digital advertising</p>	<p style="text-align: right;">Page 28</p> <p>1 You've told me that several times, but as of 2 today, would you call yourself an expert in 3 digital advertising?</p> <p>4 MR. NAKAMURA: Objection to form.</p> <p>5 THE WITNESS: So here I'm testifying as 6 an economic expert and as somebody who has 7 studied digital advertising, in particular, 8 web display advertising, at some length for 9 the past several years.</p> <p>10 BY MR. ISAACSON:</p> <p>11 Q So would you -- as of today, would you 12 call yourself an expert in digital advertising?</p> <p>13 MR. NAKAMURA: Objection to form.</p> <p>14 THE WITNESS: I don't have -- I'm not 15 applying a label to myself of that form.</p> <p>16 BY MR. ISAACSON:</p> <p>17 Q You're aware that the United States is 18 seeking damages in this case on behalf of federal 19 agency advertisers; is that right?</p> <p>20 A I'm aware.</p> <p>21 Q And you are not expressing opinions in 22 this case about whether those federal agencies</p>
<p style="text-align: right;">Page 27</p> <p>1 specifically, although some of my work, 2 including that on cable television markets, 3 touched upon advertising, and in my teaching, 4 I do, as an industrial organization 5 economist, cover advertising as an economic 6 concept.</p> <p>7 BY MR. ISAACSON:</p> <p>8 Q So based on that work you had done as 9 you -- that touched on digital advertising, before 10 the fall of 2019, did you consider yourself to be 11 an expert in digital advertising?</p> <p>12 MR. NAKAMURA: Objection to form.</p> <p>13 THE WITNESS: I don't think I ever 14 called myself an expert --</p> <p>15 BY MR. ISAACSON:</p> <p>16 Q And I understand --</p> <p>17 A -- in digital advertising.</p> <p>18 Q Thank you. I didn't mean to interrupt 19 you.</p> <p>20 And I understand that based on your 21 background in economics, you are applying your 22 expertise to digital advertising in this case.</p>	<p style="text-align: right;">Page 29</p> <p>1 have suffered any antitrust injury, correct?</p> <p>2 MR. NAKAMURA: Objection to form.</p> <p>3 THE WITNESS: So I'm expressing the 4 opinion that certain actions taken by Google 5 with respect to its ad tech products have 6 harmed customers of its products which 7 include advertisers.</p> <p>8 BY MR. ISAACSON:</p> <p>9 Q And are you expressing any opinion in 10 this case about whether the federal agency 11 advertisers have suffered any damages?</p> <p>12 MR. NAKAMURA: Objection to form.</p> <p>13 THE WITNESS: So again, my opinion is 14 that certain actions taken by Google has 15 harmed advertisers and publishers that use ad 16 tech products to transact open-web display 17 advertising.</p> <p>18 BY MR. ISAACSON:</p> <p>19 Q Are you expressing any opinions in this 20 case about the amount of any damages of any 21 federal agency advertiser?</p> <p>22 MR. NAKAMURA: Objection to form.</p>

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<p style="text-align: right;">Page 30</p> <p>1        THE WITNESS: I'm not providing a 2        precise number of damages for these 3        particular advertising customers.</p> <p>4 BY MR. ISAACSON:</p> <p>5        Q And based on your background in 6        economics and industrial organization, as I 7        understand it, you are not offering expert 8        opinions on the meaning of any individual 9        documents in this case?</p> <p>10        MR. NAKAMURA: Objection to form.</p> <p>11        THE WITNESS: Can you restate your 12        question or rephrase it?</p> <p>13 BY MR. ISAACSON:</p> <p>14        Q Are you offering expert opinions on the 15        meaning of any individual documents in this case?</p> <p>16        MR. NAKAMURA: Objection to form.</p> <p>17        THE REPORTER: Meaning?</p> <p>18        MR. ISAACSON: Meaning, yes.</p> <p>19        THE WITNESS: I'm not.</p> <p>20        MR. NAKAMURA: Same objection.</p> <p>21 BY MR. ISAACSON:</p> <p>22        Q And you are not expressing an opinion in</p>	<p style="text-align: right;">Page 32</p> <p>1        opinion that certain Google products, in 2        particular -- I'm sure we'll discuss them -- 3        Google Ads, AdX, and DFP, possess substantial 4        and sustained market power protected by 5        significant barriers to entry, which are 6        associated with economic profits.</p> <p>7 BY MR. ISAACSON:</p> <p>8        Q Are you expressing an opinion in this 9        case as to the amount of economic profits for 10        Google ad tech products?</p> <p>11        MR. NAKAMURA: Objection to form.</p> <p>12        THE WITNESS: As I stated before, I'm 13        expressing an opinion regarding the extent of 14        market power for these products which would 15        be associated with a positive economic 16        profit.</p> <p>17 BY MR. ISAACSON:</p> <p>18        Q All right. My question went to the 19        amount of economic profits.</p> <p>20        Are you expressing an opinion in this 21        case as to the amount of economic profits for 22        Google ad tech products?</p>
<p style="text-align: right;">Page 31</p> <p>1        this case on the accounting profits of any Google 2        product area; is that correct?</p> <p>3        MR. NAKAMURA: Objection to form.</p> <p>4        THE WITNESS: Can you restate your 5        question, please.</p> <p>6 BY MR. ISAACSON:</p> <p>7        Q Sure. You are not expressing an opinion 8        in this case on the accounting profits of any 9        Google product area in this case; am I correct?</p> <p>10        MR. NAKAMURA: Objection to form.</p> <p>11        THE WITNESS: So in my reports I do 12        discuss accounting profits and their 13        differences from economic profits, but I'm 14        not expressing opinions as to the level of 15        accounting profits for Google, Google's ad 16        tech products.</p> <p>17 BY MR. ISAACSON:</p> <p>18        Q Are you expressing an opinion in this 19        case as to the level of economic product -- 20        economic profits for Google's ad tech products?</p> <p>21        MR. NAKAMURA: Objection to form.</p> <p>22        THE WITNESS: So I'm expressing an</p>	<p style="text-align: right;">Page 33</p> <p>1        MR. NAKAMURA: Objection to form.</p> <p>2        THE WITNESS: My opinion is that Google 3        Ads, AdX and DFP are earning economic profits 4        consistent with their possession of 5        substantial and sustained market power.</p> <p>6 BY MR. ISAACSON:</p> <p>7        Q And have you expressed an opinion as to 8        the amount of those profits, those economic 9        profits that you just referred to?</p> <p>10        A I believe that is saying something about 11        the amount, what I just said.</p> <p>12        Q Is saying -- are you able to express an 13        opinion as to the amount of economic profits from 14        Google ad tech products in a dollar amount?</p> <p>15        MR. NAKAMURA: Objection to form.</p> <p>16        THE WITNESS: So I'm not providing a 17        specific dollar number for that measure.</p> <p>18 BY MR. ISAACSON:</p> <p>19        Q Before you were retained in this case, 20        had you heard the term "open-web display 21        advertising"?</p> <p>22        A So before I was retained by this case, I</p>

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<p style="text-align: right;">Page 34</p> <p>1 recall hearing the term "open-web" in contrast      2 with "walled garden," and I recall being familiar      3 with display advertising. I think I noted my      4 experience 15 years prior, looking into this      5 space.</p> <p>6 Q And before this case, had you heard the      7 term "open-web display advertising" as one term      8 with all four words?</p> <p>9 A I do not recall having come across those      10 four words together.</p> <p>11 (Exhibit 1 was marked for      12 identification.)</p> <p>13 (Exhibit 2 was marked for      14 identification.)</p> <p>15 (Exhibit 3 was marked for      16 identification.)</p> <p>17 BY MR. ISAACSON:</p> <p>18 Q We've marked as Exhibit 1 your opening      19 expert report, we've marked as Exhibit 2 your      20 rebuttal report, and Exhibit 3 is your      21 supplemental report.</p> <p>22 You have them all in front of you for</p>	<p style="text-align: right;">Page 36</p> <p>1 MR. NAKAMURA: Objection to form.      2 THE WITNESS: I'm sorry. Can you repeat      3 your question, please.</p> <p>4 BY MR. ISAACSON:</p> <p>5 Q Sure.</p> <p>6 So in that bullet point, it lists      7 markets, potential markets for publisher ad      8 servers, ad exchanges, and advertiser ad networks,      9 all for open-web display advertising. You were      10 asked to determine whether those are relevant      11 antitrust markets.</p> <p>12 My question is: Were you asked to      13 consider any other market definition than those      14 potential market definitions?</p> <p>15 A So I recall looking into whether there      16 is a relevant market for demand-side platforms, a      17 relevant antitrust product market for demand-side      18 platforms.</p> <p>19 Q All right. Other than looking into a      20 relevant market for demand-side platforms, were      21 you asked to consider any other potential relevant      22 markets other than those which are listed in</p>
<p style="text-align: right;">Page 35</p> <p>1 ease of access at any point.</p> <p>2 If I can ask you to look at paragraph 7      3 of your opening report. That's Exhibit 1. In      4 paragraph 7 you say, "I have been asked by counsel      5 at the Department of Justice," and then you list a      6 number of things.</p> <p>7 In the first bullet point, you say --      8 again, with reference to "I have been asked by      9 counsel at the Department of Justice to --      10 Determine whether publisher ad servers, ad      11 exchanges, and advertiser ad networks are open-web      12 display advertising, both worldwide . . . and in      13 the United States, are relevant antitrust      14 markets."</p> <p>15 I skipped a parenthetical about how      16 worldwide is developed.</p> <p>17 The -- were you asked to consider any      18 other market definition that would be at issue in      19 this case other than what is said there, whether      20 publisher ad servers, ad exchanges and advertiser      21 ad networks for open-web display advertising are      22 relevant antitrust markets?</p>	<p style="text-align: right;">Page 37</p> <p>1 paragraph 7?</p> <p>2 MR. NAKAMURA: I'll instruct Professor      3 Lee to answer to the extent to which he      4 considered the other markets that counsel      5 asked about, not any communications from      6 counsel to him.</p> <p>7 THE WITNESS: So I also considered a      8 relevant antitrust product market for a      9 broader set of bidding tools, which includes      10 advertiser ad networks and demand-side      11 platforms, but as I note in my reports,      12 concluded that the smaller subset of      13 advertiser ad networks comprises a relevant      14 antitrust product market.</p> <p>15 BY MR. ISAACSON:</p> <p>16 Q So other than markets for publisher ad      17 servers, ad exchanges, advertiser ad networks, all      18 for open-web display advertising, or a relevant      19 market for demand-side platforms or for ad      20 networks and demand-side platforms, did you      21 consider any other potential market definitions in      22 this case?</p>

<p style="text-align: right;">Page 38</p> <p>1 MR. NAKAMURA: Objection to form.</p> <p>2 THE WITNESS: So in this case, as I note 3 in my rebuttal report, I considered 4 alternative markets that were proposed by 5 Dr. Israel and potentially Doctor or 6 Professor Ghose, but those alternative market 7 definitions proposed by Google's experts or 8 others that I examined and opined are not 9 appropriate for evaluating Google's market 10 power over its ad tech products that I 11 examined for evaluating the competitive 12 effects of its conduct that I examined.</p> <p>13 BY MR. ISAACSON:</p> <p>14 Q The -- do you know if the term "open-web 15 display advertising" existed before counsel for 16 the Department of Justice asked you to consider 17 that term for your market definition?</p> <p>18 MR. NAKAMURA: Objection to form.</p> <p>19 THE WITNESS: So as an economist, I'm 20 interpreting "open-web display advertising" 21 as referring to a set of transactions with 22 certain characteristics used to be precise</p>	<p style="text-align: right;">Page 40</p> <p>1 display advertising or the underlying digital 2 advertisements themselves?</p> <p>3 BY MR. ISAACSON:</p> <p>4 Q I'm going to ask you if you've seen 5 industry sources reporting market shares for any 6 products that would include the term "open-web 7 display advertising."</p> <p>8 A So can I ask you to rephrase the 9 question? You're asking if I've seen market 10 shares of products that sell open-web display 11 advertising?</p> <p>12 Q Any type of products. Does it -- like 13 it can be any market, any market share where the 14 terms "open-web display advertising" is used.</p> <p>15 MR. NAKAMURA: Objection to form.</p> <p>16 THE WITNESS: So in my -- maybe I'm not 17 understanding your question correctly, but in 18 my report, for example, I've seen a Google 19 document talking about -- discussing DFP's 20 share across various measures of what they 21 refer to as "addressable inventory" or "not 22 walled garden," and the addressable inventory</p>
<p style="text-align: right;">Page 39</p> <p>1 about the products that I'm examining. 2 I have seen materials -- I don't recall 3 the precise dates for those documents -- 4 where both the term "open-web," the term 5 "display advertising," as well as I've seen 6 documents from firms where "open-web display 7 advertising," those four words, have been 8 used.</p> <p>9 BY MR. ISAACSON:</p> <p>10 Q Do you believe you've seen documents 11 where all four words, "open-web display 12 advertising," were used together?</p> <p>13 A I recall seeing documents produced by 14 Adobe and Facebook, although one of them may be an 15 industry source that used open-web display.</p> <p>16 Q The -- have you seen any industry 17 sources that report market shares for open-web 18 display advertising?</p> <p>19 MR. NAKAMURA: Objection to form.</p> <p>20 THE WITNESS: So if I may ask you to be 21 more specific. Are you referring to ad tech 22 products that facilitate the sale of open-web</p>	<p style="text-align: right;">Page 41</p> <p>1 overlaps with open-web publishers, publishers 2 that don't -- that aren't using integrated ad 3 tech tools to sell their inventory.</p> <p>4 BY MR. ISAACSON:</p> <p>5 Q We can talk about addressable inventory 6 later, but whether it's advertising, technology, 7 whatever product you want to name, have you seen 8 any industry sources that report market shares for 9 a market using the words "open-web display 10 advertising"?</p> <p>11 MR. NAKAMURA: Objection to form.</p> <p>12 THE WITNESS: So those documents I 13 referenced earlier, I don't recall if they 14 report any market share figures. I don't 15 recall, sitting here today.</p> <p>16 BY MR. ISAACSON:</p> <p>17 Q And let me see if I can -- so there are 18 public industry sources that report on -- report 19 data for digital advertising, correct?</p> <p>20 MR. NAKAMURA: Objection to form.</p> <p>21 THE WITNESS: Yes, I believe there are 22 public sources, including e-Marketer, that</p>

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<p style="text-align: right;">Page 42</p> <p>1 looks at digital advertising.</p> <p>2 BY MR. ISAACSON:</p> <p>3 Q Have you seen any industry sources that</p> <p>4 report public data that would reflect shares of</p> <p>5 any market that uses the term "open-web display"</p> <p>6 advertising"?</p> <p>7 MR. NAKAMURA: Objection to form.</p> <p>8 THE WITNESS: I think, as I mentioned</p> <p>9 before, sitting here today, I don't recall if</p> <p>10 any of the documents that I remember using</p> <p>11 the terms "open-web display" report market</p> <p>12 share figures or rely upon public data.</p> <p>13 BY MR. ISAACSON:</p> <p>14 Q And is it also the case that, sitting</p> <p>15 here today, you don't recall any documents from</p> <p>16 Google that report market shares using the term</p> <p>17 "open-web display advertising"?</p> <p>18 A Sitting here today, I do not recall any</p> <p>19 Google documents using the term "open-web display"</p> <p>20 advertising" that report market shares for ad tech</p> <p>21 products.</p> <p>22 Q And sitting here today, from the</p>	<p style="text-align: right;">Page 44</p> <p>1 using the term "open-web" to refer to publisher</p> <p>2 inventory or publisher web inventory that is not</p> <p>3 sold through integrated ad tech products, and it's</p> <p>4 a description of what that set of inventory is.</p> <p>5 I use "display advertising" to refer to</p> <p>6 a particular form of digital advertising, and so</p> <p>7 when I use those terms, it's meant to clarify the</p> <p>8 sets of products and transactions over which</p> <p>9 certain calculations are made.</p> <p>10 Q I'm not asking you how you're using the</p> <p>11 term or why you're using the term.</p> <p>12 You, in your reports, do estimates of</p> <p>13 market shares where -- different markets where you</p> <p>14 use the term "open-web display advertising,"</p> <p>15 correct?</p> <p>16 A So the relevant product markets that I</p> <p>17 evaluate are those involving advertiser ad</p> <p>18 networks, ad exchanges, and publisher ad servers,</p> <p>19 so those are the markets.</p> <p>20 Q So you estimate market shares in your</p> <p>21 report for a market of publisher ad servers for</p> <p>22 open-web display advertising, correct?</p>
<p style="text-align: right;">Page 43</p> <p>1 third-party documents that have been made</p> <p>2 available to you from this case, am I correct you</p> <p>3 do not recall any third-party documents that use</p> <p>4 the term "open-web display advertising" to report</p> <p>5 market shares for any products?</p> <p>6 A So as I noted earlier, I recall</p> <p>7 third-party documents using the term "open-web</p> <p>8 display." I do not recall if they reported market</p> <p>9 shares for specific ad tech products.</p> <p>10 Q To your knowledge, is this case the</p> <p>11 first time anyone has tried to assemble market</p> <p>12 share data using the term "open-web display"</p> <p>13 advertising"?</p> <p>14 A I'm not quite sure what you mean by</p> <p>15 assemble data using a term. I understand what it</p> <p>16 means to assemble data restricted to a set of</p> <p>17 products with certain features.</p> <p>18 Q So let me explain.</p> <p>19 You have, in your reports, estimated</p> <p>20 market shares for markets where you're using the</p> <p>21 term "open-web display advertising," correct?</p> <p>22 A So as an economist, in my reports I'm</p>	<p style="text-align: right;">Page 45</p> <p>1 A These are publisher ad servers which are</p> <p>2 used to transact open-web display advertising.</p> <p>3 Q Is that a yes?</p> <p>4 A I'm sorry. What is your question?</p> <p>5 Q In your report, you estimate market</p> <p>6 shares for publisher ad servers for open-web</p> <p>7 display advertising, correct?</p> <p>8 A I do provide market shares for publisher</p> <p>9 ad servers that facilitate the transaction of</p> <p>10 open-web display advertising.</p> <p>11 Q And in your reports, you report market</p> <p>12 shares for ad exchanges for open-web display</p> <p>13 advertising, correct?</p> <p>14 A I do report market shares for ad</p> <p>15 exchanges that facilitate the sale of open-web</p> <p>16 display advertising.</p> <p>17 Q And in your, in your report, you report</p> <p>18 market shares for advertiser ad networks for</p> <p>19 open-web display advertising, correct?</p> <p>20 A In my report I do report market shares</p> <p>21 for --</p> <p>22 THE REPORTER: Hold on just a moment.</p>

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<p style="text-align: right;">Page 66</p> <p>1 you know, my opinions regarding market 2 definition are based on the totality of 3 evidence that I present.</p> <p>4 I think a strong set of evidence that I 5 discuss which supports the validity of the 6 relevant product markets is Google's exercise 7 of market power over its AdX, Google Ads and 8 DFP product, right?</p> <p>9 So I'm looking at not just a single 10 piece of evidence, but the totality of 11 evidence to form my opinions regarding market 12 definition.</p> <p>13 BY MR. ISAACSON:</p> <p>14 Q If products have incremental value of a 15 certain magnitude, you would consider that 16 evidence that they are not close substitutes; is 17 that correct?</p> <p>18 MR. NAKAMURA: Objection to form.</p> <p>19 THE WITNESS: I think that it is an 20 important consideration whether or not a set 21 of, here, digital advertisements provide 22 distinct value over other forms of digital</p>	<p style="text-align: right;">Page 68</p> <p>1 differences between products can be evidence that 2 two products are -- I'm doing a double negative 3 now, so let me just ask you: In order for -- do 4 you agree that incremental differences of a 5 certain magnitude can be evidence that two 6 products are not close substitutes?</p> <p>7 MR. NAKAMURA: Objection to form.</p> <p>8 THE WITNESS: I guess the question is 9 imprecise. What do you, what do you mean 10 by -- I think what I said before is examining 11 whether, in this case, open-web display 12 advertising has distinct incremental value 13 over other forms of digital advertising is an 14 important consideration in my analysis of 15 whether the relevant product markets I 16 evaluate are valid and pass the hypothetical 17 monopolist test.</p> <p>18 BY MR. ISAACSON:</p> <p>19 Q And how do you determine whether 20 something has -- two products have -- one product 21 has distinct incremental value?</p> <p>22 A I think a large part of my report talks</p>
<p style="text-align: right;">Page 67</p> <p>1 advertising. I think that's important to 2 understand, but when I get to market 3 definition, I'll be focusing on the tools 4 used to transact those digital 5 advertisements, and there I will also 6 consider the extent to which the underlying 7 tools can be replaced with other 8 alternatives.</p> <p>9 BY MR. ISAACSON:</p> <p>10 Q And as an economist, how would you look 11 at -- how would you decide whether, what magnitude 12 is necessary for -- I'll start that question over.</p> <p>13 In order for incremental differences to 14 be evidence that two products are not close 15 substitutes, how would you define the magnitude 16 that's necessary of that difference?</p> <p>17 MR. NAKAMURA: Objection to form.</p> <p>18 THE WITNESS: So the preamble to your 19 question is not something that I stated or 20 necessarily agree with.</p> <p>21 BY MR. ISAACSON:</p> <p>22 Q You don't agree that incremental</p>	<p style="text-align: right;">Page 69</p> <p>1 about reasons why open-web display advertising is 2 an important form of monetization for -- let's 3 focus on publishers.</p> <p>4 So for publishers, open-web display 5 advertising is significant evidence that speaks to 6 the value it has for helping them monetize their 7 web inventory.</p> <p>8 Q How do I, how do I determine whether 9 something, in your view, would have distinct 10 incremental value? For example, does Coke have 11 distinct incremental value over Pepsi?</p> <p>12 A Well, I'm not valuating soft drinks in 13 this matter. What I'm doing is showing here, for 14 the purpose of looking at ad tech products, 15 publishers derive significant value, additional 16 monetization from being able to sell their web 17 inventory through display ads.</p> <p>18 And if they did not have access to those 19 tools that allow them to sell display ads, they 20 would be foregoing a significant amount of 21 advertising revenue, which would likely lead to a 22 reduction of content and investment.</p>

18 (Pages 66 - 69)

<p style="text-align: right;">Page 70</p> <p>1        And in my report, I discuss why other      2 forms of digital advertising are unlikely to be      3 effective replacements for display advertising.      4        Q    And in your view, can two products that      5 have distinct incremental value from one another      6 be close substitutes?</p> <p>7        MR. NAKAMURA: Objection to form.</p> <p>8        THE WITNESS: I think, I think this is      9 why one needs to look at the totality of the      10 evidence and to look at other things to      11 inform whether, in this case, ad tech      12 products like ad exchanges, if controlled by      13 a hypothetical monopolist, could exercise      14 market power over competitive levels.</p> <p>15 BY MR. ISAACSON:</p> <p>16        Q    Let me repeat the question, because      17 you're saying "I think this is why," and I don't      18 know what you're talking about.</p> <p>19        In your view, can two products that have      20 distinct incremental value from one another be      21 close substitutes?</p> <p>22        MR. NAKAMURA: Objection to form.</p>	<p style="text-align: right;">Page 72</p> <p>1 or not ad tech products, ad exchanges, ad      2 networks, advertiser ad networks, and publisher ad      3 servers --</p> <p>4        Q    I don't know what that has to do with my      5 question. Let me repeat my question.</p> <p>6        Can two products that have significant      7 incremental value differences from one another be      8 close substitutes?</p> <p>9        A    It's difficult to provide a general      10 statement. This is why I'm looking at the      11 totality of evidence to inform my opinions      12 regarding market definition.</p> <p>13        Q    The -- and you are using the term "close      14 substitutes" for your analysis in this case,      15 because you find the term "reasonable substitute"      16 to be too vague; is that correct?</p> <p>17        A    Well, the "reasonable substitute"      18 language you used in your question without      19 appropriate context, I wanted to clarify.</p> <p>20        So in my report, when I use "close      21 substitute," what I'm talking about is      22 substitution that's sufficient to constrain the</p>
<p style="text-align: right;">Page 71</p> <p>1        THE WITNESS: I think I answered this      2 question before, that it will depend on other      3 things, including magnitude. If there's de      4 minimus incremental value, then it may not be      5 the case.</p> <p>6 BY MR. ISAACSON:</p> <p>7        Q    I'm using your term, "distinct      8 incremental value," right? In your view, can two      9 products that have distinct incremental value from      10 one another be close substitutes?</p> <p>11        A    So when I'm using "distinct incremental      12 value" here for the purposes of open-web display      13 advertising, I'm describing why it provides      14 significant incremental value to the customers who      15 rely upon it.</p> <p>16        Q    So can two products that have      17 significant incremental value from one another be      18 close substitutes?</p> <p>19        A    So if we're talking about digital      20 advertising, I'm not evaluating, for the present      21 market definition, substitution among digital      22 advertising. The focus of my inquiry is whether</p>	<p style="text-align: right;">Page 73</p> <p>1 exercise of market power, and it depends on the      2 context we're using it, right?</p> <p>3        So for market definition, I am applying      4 an economic framework known as the hypothetical      5 monopolist test, and for that test, it's important      6 to consider the extent to which a hypothetical      7 monopolist, over a set of products, would be      8 constrained by alternatives, outside of the      9 products it controls, from exercising significant      10 market power over competitive levels.</p> <p>11        Q    So you've tried to, you've tried to      12 clarify the context of the question.</p> <p>13        I'm asking you: You're using the term      14 "close substitute" for your analysis in this case      15 rather than "reasonable substitutes," because you      16 think the language "reasonable substitutes" is too      17 vague; is that correct?</p> <p>18        A    That statement I made earlier was in the      19 context of the question you asked. I don't know      20 if I used term "reasonable" elsewhere in my      21 reports, which might have been a different      22 context, but I was saying for today, when I use</p>

1 the term close substitutes and when you use close 2 substitutes in my reports, the description I 3 provided earlier is what I mean by that.  4 Q Today you prefer the term "close 5 substitutes" because you think the term 6 "reasonable substitutes" is vague; is that 7 correct?  8 A At present, without having provided a 9 definition for that, I would say that it is not 10 clear. I want to be precise.  11 Q The -- you agree that a variety of ad 12 tech products work in conjunction with one another 13 to facilitate display advertising transactions, 14 correct?  15 MR. NAKAMURA: Objection to form. 16 THE WITNESS: So particular ad tech 17 products, the ones I discuss, advertiser ad 18 networks, ad exchanges, publisher ad servers, 19 are often used in conjunction with one 20 another by advertisers and publishers to 21 transact open-web display advertising. 22	Page 74  1 These products form what is known as the 'ad tech 2 stack.'" 3 That's what you've written there, 4 correct? 5 A That is what I wrote there. 6 Q And you would consider Google to have an 7 ad tech stack; is that right? 8 A So the way that I'm using the term here 9 is to refer to the set of all the products that 10 are used to facilitate display advertising, so 11 publisher ad servers, ad exchanges and advertiser 12 bidding tools, which include DSPs and advertiser 13 ad networks. Those products overall are what I, 14 what I am referring to as an, as the ad tech 15 stack. 16 Q So that wasn't my question. 17 My question was: Do you consider Google 18 to have an ad tech stack? 19 A So I consider Google to be a firm that 20 offers products within what is known as the ad 21 tech stack. 22 Q You consider Google to offer something
1 BY MR. ISAACSON: 2 Q And you would refer to ad tech products 3 working in conjunction with one another as an "ad 4 tech stack"; is that right? 5 MR. NAKAMURA: Objection to form. 6 THE WITNESS: I think I and other 7 industry participants have used the term "ad 8 test stack" to refer to the set of products, 9 not necessarily them working in conjunction 10 with one another. It's a set of products 11 that, you know, facilitate the sale of 12 open-web display advertising. 13 MR. NAKAMURA: Counsel, we've been going 14 for about an hour and 15. 15 MR. ISAACSON: Let me just -- I'll be 16 done with this in a minute. 17 BY MR. ISAACSON: 18 Q Paragraph 53 of your opening report, 19 which is page 26, in paragraph 53 you write, "A 20 variety of ad tech products work in conjunction 21 with one another to facilitate display advertising 22 transactions between publishers and advertisers.	Page 75  1 that's within the ad tech stack but not to offer 2 itself an ad tech stack; is that correct? 3 A Again, I'm using the ad tech stack to 4 refer to these three -- I say, called them 5 "layers" of ad tech products, and Google offers 6 products in each of those layers. 7 Q Do you consider Google to offer an ad 8 tech stack with those three layers? 9 A I can't answer your question. I don't 10 consider Google to offer the stack. The stack 11 refers to the set of all the products that are in 12 these layers, and Google offers products contained 13 within these layers. In particular, the ones I 14 focus on are Google Ads, AdX and DFP. 15 Q Paragraph 53 you say, "At a high level, 16 the ad tech stack can be described as comprising 17 three layers," and then you define the three 18 layers as "publisher ad servers, ad exchanges and 19 advertiser bidding tools." 20 Does Google offer ad tech with publisher 21 ad servers, ad exchanges, and advertiser bidding 22 tools?

<p style="text-align: right;">Page 78</p> <p>1 A So Google offers a publisher ad server, 2 an ad exchange, an advertiser ad network, and a 3 demand-side platform.</p> <p>4 Q And at a high level, do you believe 5 Google is offering a, is offering an ad tech 6 stack?</p> <p>7 MR. NAKAMURA: Objection to form.</p> <p>8 THE WITNESS: So at a high level, I'm 9 referring to the ad tech stack, which 10 represents -- I think I said this before -- 11 all the products that are in these different 12 layers, and again, Google offers products 13 which are contained within this broader ad 14 tech stack which describes these different 15 layers.</p> <p>16 BY MR. ISAACSON:</p> <p>17 Q Do you deny that Google is offering, at 18 a high level, an ad tech stack consisting of three 19 layers that include publisher ad servers, ad 20 exchanges, and advertiser bidding tools?</p> <p>21 MR. NAKAMURA: Objection to form.</p> <p>22 THE WITNESS: So how I and other -- I</p>	<p style="text-align: right;">Page 80</p> <p>1 THE VIDEOGRAPHER: Going off the record 2 at 11:02 a.m. 3 (Whereupon, a short recess was 4 taken.)</p> <p>5 THE VIDEOGRAPHER: Going back on the 6 record at 11:19 p.m. You may proceed. 7 (Exhibit 4 was marked for 8 identification.)</p> <p>9 BY MR. ISAACSON:</p> <p>10 Q Marked as Lee Exhibit 4 is a document 11 dated November 2020, Bates-stamped 12 GOOG-DOJ-AT-OO855803 to 813. 13 If you look at page 807 at the bottom -- 14 take a look at 807 at the bottom. 15 You referred earlier in the deposition 16 to a document that referred to -- it had a market 17 share and used the term "addressable inventory"? 18 A I did refer to a document. This is not 19 the one I had in mind. 20 Q Okay. You cited it. We took a shot at 21 it, because it says "addressable inventory," and 22 you cite it at footnote 252 of your report.</p>
<p style="text-align: right;">Page 79</p> <p>1 believe other industry participants have used 2 the term "ad tech stack" is to refer to this 3 entire -- I'm going to use loosely the word 4 "industry," but essentially the set of 5 products falling into these different layers. 6 So no single firm offers the entire ad 7 tech stack, because the ad tech stack has 8 different participants, although Google does 9 have a very large share of each of these 10 layers, but is not the only provider of 11 products.</p> <p>12 BY MR. ISAACSON:</p> <p>13 Q So Google does not offer an ad tech 14 stack, in your view?</p> <p>15 MR. NAKAMURA: Objection to form.</p> <p>16 THE WITNESS: The way I am using the 17 term, and I put it in quotes, "ad tech stack" 18 refers to, I think I said in the last answer, 19 the entirety of these layers, all of the 20 products that are in each of these layers.</p> <p>21 MR. ISAACSON: Let's take a break.</p> <p>22 MR. NAKAMURA: Okay.</p>	<p style="text-align: right;">Page 81</p> <p>1 MR. NAKAMURA: That's at page 81. 2 THE WITNESS: So footnote 252? 3 BY MR. ISAACSON: 4 Q Yes. 5 A I'm citing to page 808. 6 Q That might be an error, because 807 says 7 "addressable inventory" and 808 does not. 8 A But footnote 252 is attached to a 9 sentence that states "a 2020 Google" -- 10 THE REPORTER: Could you slow down? Is 11 attached to a statement -- 12 THE WITNESS: To a statement that is not 13 referring to addressable inventory. 14 BY MR. ISAACSON: 15 Q But -- so but page 807 is not the 16 document you were referring to that -- referring 17 to addressable inventory and having a market 18 share? 19 It will help you to look at 807 to 20 answer this question. 21 A So 807 I see later in my report, in 22 Figure 41, it does show this. I was thinking in</p>

**Errata Sheet for the Deposition Transcript of Professor Robin S. Lee**

**Case Name:** *United States et al v. Google LLC*, No. 1:23-cv-00108-LMB-JFA (E.D. Va.)

**Depo. Date:** March 15, 2024

**Deponent:** Robin Lee

<b>Page</b>	<b>Line</b>	<b>Correction</b>	<b>Reason for Correction</b>
10	10	Change “White?” to “pretty wide?”	Transcription error
17	6	Change “9:48 pm” to “9:49 am”	Transcription error
23	11	Change “Dr. Weintrop” to “Dr. Weintraub”	Transcription error
33	19	Change “in” to “for”	Transcription error
38	2	Change “I note” to “noted”	Transcription error
38	7	Change “or” to “are”	Transcription error
38	11	Change “for” to “or”	Transcription error
44	13	Change “different” to “for”	Transcription error – glitch in audio
58	20	Add “display advertising” after “open-web”	Transcription error
59	3	Change “customer” to “customers”	Transcription error
59	4	Add “product” before “markets”	Transcription error
65	13	Change “advertise bits” to “advertisements”	Transcription error
69	4 – 5	Change “So for publishers, open-web display advertising is significant evidence” to “So for publishers, open-web display advertising -- there is significant evidence”	Transcription error
69	12	Change “valuating” to “evaluating”	Transcription error
73	20	Add “the” before “term”	Transcription error
74	1	Change “you use” to “I use”	Transcription error
80	6	Change “p.m.” to “a.m.”	Transcription error
80	12	Change “GOOG-DOJ-AT-OO855803 to” to “GOOG-DOJ-AT-00855803 through”	Transcription error and spelling for clarity
94	13	Change “(indecipherable) -- elsewhere” to “as I noted earlier elsewhere --”	Transcription error
107	9	Change “ad networks I provided data” to “ad networks that provided data”	Transcription error
108	1	Change “curtailed, as you noted,” to “; Criteo, as you noted;”	Transcription error
109	8	Change “them are of these” to “them -- or of these - -”	Transcription error

112	4	Change “this application” to “its applications”	Transcription error
112	5	Change “those were present” to “it was present”	Transcription error
115	16	Change “the web and ad property” to “a web and an app property”	Transcription error
117	14	Change “display, with regards” to “display. With regards”	Transcription error
126	8 – 9	Change “this app component” to “there was an app component”	Transcription error
127	14	Change “Google display network” to “Google Display Network”	Capitalization for clarity
128	1	Change “DFPs” to “DFP”	Transcription error
129	5	Change “DC360” to “DV360”	Transcription error
129	13	Add double quotation mark after “rivals.”	Transcription error
129	21	Change “methods to monopolization” to “methods of monopolization”	Transcription error
130	2	Change “to rivals” to “of rivals”	Transcription error
132	7	Change “firm” to “firm’s”	Transcription error
143	1	Add “of this figure” after “unaddressable part.”	Transcription error
143	16	Change “In paragraphs 12 and 3” to “In paragraph 12 on page 3”	Transcription error
146	14	Change “advertisers side” to “advertiser side”	Transcription error
162	8	Change “open bidding” to “Open Bidding”	Capitalization for clarity
174	16	Change “accommodation” to “competition”	Transcription error
180	2 – 3	Change “experience in” to “experiments and”	Transcription error
180	21	Change “AdX’s” to “Ads-AdX”	Transcription error
181	20	Change “Ads, AdX’s” to “Ads-AdX”	Transcription error
184	8	Remove extra space before “de minimus”	Formatting for clarity
189	15	Change “anyone can have last-look over” to “any one to have last-look over”	Transcription error
196	8	Change “shares” to “share”	Transcription error
196	21 – 22	Change “computed for –” to “computed for – users”; delete “By Mr. Isaacson: Q Users?”	Lee added “users,” not Isaacson; Isaacson wasn’t questioning
199	9	Change “Exhibit 7” to “Lee Exhibit 7”	Transcription error
200	9 – 10	Change “whether – the value of whether” to “whether he’s evaluated”	Transcription error
200	11	Change “antirust” to “antitrust”	Transcription error
201	11	Change “the” to “this”	Transcription error

202	3	Change “it as” to “as a”	Transcription error
203	1	Change “advertiser ad network --” to “advertiser ad network product --”	Transcription error
206	7	Change “average than a disproportionate” to “average, and a disproportionate”	Transcription error
207	3	Change “advertisers, the highest” to “advertisers with the highest”	Transcription error
207	18	Change “zero zero” to “zero-zero”	Punctuation for clarity
208	6	Change “zero zero” to “zero-zero”	Punctuation for clarity
208	16 – 17	Change “Could I inspect that real briefly before I hand it back to you?” to “And, Professor Lee, could I just inspect that briefly before you take a look and I’ll hand it back to you?”	Transcription error
208	18	Change “Okay” to “Here you go”	Transcription error
208	20	Change “I’ve given you Figure 1 [sic] and drawn” to “In Figure -- I’ve given you Figure 1 [sic] and drawn -- and drawn”	Transcription error
209	17	Remove “then” before “an increase”	Transcription error
211	1 – 2	Change “are we referring to Figure 16 instead of Figure 1?” to “I’d like to note that we’re referring to Figure 16 and I think you said Figure 1, so I just want to make that clear.”	Transcription error
212	9	Change “Like none of my reports -- ” to “So, as I said in my reports,”	Transcription error
213	12	Insert “in” before “the main text”	Transcription error
214	16	Change “declines to” to “declines from”	Transcription error
215	17	Change “between 15 and 20, maybe halfway” to “between 15—maybe halfway”	Transcription error
216	9	Change “is the end” to “is either the end”	Transcription error
219	7	Change “It’s” to “If it’s”	Transcription error
220	14	Insert “for” after “difficult”	Transcription error
227	19	Insert “Which paragraph” after “Counsel?”	Transcription error
227	22	Change “Actually, the heading.” to “Actually, the heading—won’t even go to the paragraph.”	Transcription error
229	7	Change “Let me pause there” to “The -- let me pause there”	Transcription error
234	7	Change “analysis” to “analyses”	Transcription error
236	2	Change “AdX’s” to “Ads-AdX”	Transcription error
236	22	Insert “to” before “DFP”	Transcription error

239	2	Change “controlling” to “after controlling”	Transcription error
242	1 – 2	Change “could stop for a break” to “could stop soon, that’d be great.”	Transcription error
242	6	Change “Make it quick” to “I mean, if it’s quick that would be fine.”	Transcription error
242	18	Insert “at” after “transacted”	Transcription error
243	8	Change “had not opined” to “am not opining”	Transcription error
244	1	Insert quotations around “quality-adjusted.”	Punctuation for clarity
247	3	Change “Bernicky” to “Bernanke”	Transcription error
247	3 – 4	Change “CPC, CPM” to “CPC-CPM”	Transcription error
252	8	Change “AW bidding program” to “AWBid program”	Transcription error
255	19	Change “all bid” to “AWBid”	Transcription error
256	10	Change “AdSense in third-party exchanges” to “AdSense, in third-party exchanges,”	Transcription error
261	17	Change “AW bid” to “AWBid”	Transcription error
263	2	Change “they” to “I”	Transcription error
264	11	Change “E10” to “B-10”	Transcription error
264	19 – 20	Change “relevant product market among advertiser ad networks” to “relevant product market. Among advertiser ad networks”	Transcription error
267	2	Change “is” to “has”	Transcription error
288	20	Change “yield” to “yield,”	Transcription error
292	2	Change “AdX was allowed” to “AdX -- was -- allowed”	Transcription error
292	8	Change “in the” to “into”	Transcription error
296	5	Change “Abrontes” to “Abrantes”	Transcription error
296	6	Change “Abrontes” to “Abrantes”	Transcription error
296	11	Change “to” to “through”	Transcription error
298	13	Change “, which is really only a decade” to “-- which was really only at the start of the decade”	Transcription error
299	6	Change “RTV” to “RTB”	Transcription error
299	21	Change “Abrontes” to “Abrantes”	Transcription error
303	1	Change “it is cited? I mean this” to “is it cited? I mean is this”	Transcription error
305	13	Replace “?” with “.”	Transcription error
307	5	Change “I don’t recall.” to “Sitting here today, I don’t recall.”	Transcription error

307	8 – 9	Change “which is discussing unified pricing,” to “which is discussing unified pricing rules,”	Transcription error
307	15	Add a single quotation mark in front of “raises”	Lee Report quotes Jonathan Bellack starting at “raises”
307	16	Change “publics, referring pubs are” to “pubs’, referring to publishers, ‘are”	Transcription error
307	17	Add a single quotation mark after “harder.”	End of Jonathan Bellack quote
309	11	Change “buyer-specifically” to “buyer-specific”	Transcription error
309	22	Change “Abrontes” to “Abrantes”	Transcription error
311	3	Change “a changes” to “changes”	Transcription error
313	12	Add “It’s not isolated.” After answer.	Transcription error – missed in crosstalk
319	7	Change “unfeasible” to “infeasible”	Transcription error
320	2	Change “exchanges” to “changes”	Transcription error
323	22	Change “which you discuss” to “which -- you -- discuss”	Transcription error

I have inspected and read my deposition and have listed all changes and corrections above, along with my reasons therefor.

Date: 4/22/24 Signature: 